CLAIMS

What is claimed is:

1. A machining unit for a program-controlled milling and drilling machine, said machining unit comprising:

a head support movable in several coordinate axes, said support having a front face and an axis of rotation pointing forward and downward by 45°;

a swivel head arranged on the front face of the head support;

a spindle nose fixedly attached to the swivel head, said spindle nose further comprising a working spindle, said spindle nose being arranged at an axis at an angle of 45° relative to said axis of rotation of said head support;

a spindle motor mounted in the head support, said motor aligned coaxially with respect to said axis of rotation of said head support, and said motor having a shaft for rotating the swivel head about the axis of rotation of the head support; and

a bevel gear arranged on the protruding end of the shaft,

the swivel head further having a cylindrical hollow housing member coaxial with respect to the axis of rotation of the head support, and the head support having a housing neck in which the housing member of the swivel head is rotatably supported.

2. The machining unit of claim 1, wherein the head support further comprises a rotary drive for turning the swivel head, said rotary drive having a clearance-free clamped gear

train including a toothed belt drive and a pinion, said pinion constantly engaging a spur ring mounted on the motor.

3. The machining unit of claim 1, wherein a speed changing gear arrangement is positioned downstream of the bevel gear.

4. The machining unit of claim 2, wherein a speed changing gear arrangement is positioned downstream of the bevel gear.

5. The machining unit according to claim 1, wherein at least one supporting ring is mounted in the cylindrical hollow housing neck of the head support, and wherein said ring is supported in at least one peripheral groove formed in the housing member of the swivel head.

6. The machining unit according to claim 4, wherein at least one supporting ring is mounted in the cylindrical hollow housing neck of the head support, and wherein said ring is supported in at least one peripheral groove formed in the housing member of the swivel head.

7. The machining unit according to claim 1, wherein a front half portion of the spindle motor housing is fixed by the housing member of the swivel head and a rear portion of the spindle motor housing containing the spur ring projects into the head support.

8. The machining unit according to claim 5, wherein a front half portion of the spindle motor housing is fixed by the housing member of the swivel head and a rear portion of the spindle motor housing containing the spur ring projects into the head support.

9. The machining unit according to claim 6, wherein a front half portion of the spindle motor housing is fixed by the housing member of the swivel head and a rear portion of the spindle motor housing containing the spur ring projects into the head support.

10. The machining unit according to claim 1, wherein the spindle nose has a box-like rear portion and wherein an external flexible pipe adapted for protecting electrical and liquid lines extends from the head support to said box-like rear portion.

11. The machining unit according to claim 10, wherein the flexible pipe is connected to the head support via a rotating elbow connector and is pivotably connected to the box-like portion of the spindle nose via an adapter.

12. The machining unit according to claim 11,wherein the adapter contains a bushing having convex external surfaces against which a pivotable end ring abuts in a sliding fit.

13. The machining unit according to claim 11, wherein rolling elements are supported in the adapter.

14. The machining unit according to claim 12, wherein rolling elements are supported in the adapter.